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DEPARTMENT OF COMMERCE

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GEOPHYSICAL ABSTRACTS

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DEPARTMENT OF COMMERCE -- BUREAU OF MINES

GEOPHYSICAL ABSTRACTS[1]

No. 20

Compiled by Frederick W. Lee[2]

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1. GRAVITATIONAL METHODS

METHODS OF REDUCING GRAVITY OBSERVATIONS

By Walter D. Lambert

Gerlands Beiträge zur Geophysik, vol. 26, No. 2, 1930, pp. 185-188

The methods for reducing gravity observations will vary according to the purpose for which the results are to be used. For a land station Prey's method, recommended by Hopfner, would give approximately the actual value of gravity at a point within the crust directly under the gravity station. A system of values of gravity thus derived would, however, be useless either for studying the inhomogeneities of the earth's crust or for determining the figure of the earth. For these two purposes values of gravity derived from the potential for external space are needed.--Author's abstract.

DIE HYPOTHESENFREIE REDUKTION UND NUMERISCHE VERARBEITUNG DER BEOBACHTETEN SCHWERKRAFTWERTE

(THE AHYPOTHETICAL REDUCTION AND NUMERICAL WORKING UP OF THE OBSERVED GRAVITY VALUES)

By F. Hopfner

Gerlands Beiträge zur Geophysik, vol. 25, No. 4, 1930, pp. 339-347

From the results of gravity measurements and in connection with the formulas of Clairaut and Stokes, the face of an earth plane at sea-level may be determined synthetically without the aid of the hypothesis of distribution of masses inside the earth crust. Disputes about the isostatical distribution of masses inside the earth crust might be decided by computing with this method because the amount of the undulation becomes known.--Author's abstract.

UEBER EINE ABSTIMMVORRICHTUNG DER HALBSEKUNDENPENDEL STÜCKRATHSCHER FORM

(ARRANGEMENT FOR ADJUSTING HALF-SECOND PENDULUMS OF STÜCKRATH'S TYPE)

By M. Rössinger

Zeitschrift fuer Instrumentenkunde, vol. 50, No. 9, 1930, pp. 552-554.

In order that the "process of phase-opposition oscillations" (Gegenschwingungsverfahren) may be used successfully during practical pendulum measurements, it is desirable that the periods of oscillations of two pendulums swinging in opposite directions coincide as much as possible. Therefore the author thought it necessary to provide the pendulums with an arrangement by which, in addition to the adjustments made by the manufacturer, the observer can make accurate adjustment also.

Such an arrangement introduced into the four-pendulum apparatus constructed by the Askania-Werke in Bamberg is described in this article.--W. Ayvazoglou.

UEBER DEN EINFLUSS DES ERDMAGNETISCHEN FELDES AUF DIE SCHWINGUNGSZEITEN VON NICKELSTAHLPENDELN

(THE INFLUENCE OF THE EARTHMAGNETIC FIELD ON THE TIME OF OSCILLATIONS OF NICKEL STEEL PENDULUMS)

By M. Rössinger

Zeitschrift fuer Instrumentenkunde, vol. 50, No. 9, 1930, pp. 551-552

In this article the author examines the influence of the earthmagnetic field on the time of oscillations of nickel-steel pendulums and gives the results of this examination.--W. Ayvazoglou.

2. MAGNETIC METHODS

UEBER DIE MAGNETISCHE EIGENSCHAFT VON GESTEINEN

(ON THE MAGNETIC PROPERTY OF ROCKS)

By J. G. Koenigsberger

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 145-148.

The topographical magnetic effect in the Alps and in the Black Forest are given approximately by the magnetic induction calculated from the observed susceptibility; the same is true according to Carlheim-Gyllensköld for anomalies caused by the magnetic ore of Lapland. But Folgheraiter, Brunhes, David, and Chevallier could explain their observations only by remanent magnetization of the rocks studied. The author has therefore studied this question and found that all rocks have remanent magnetization, induced during cooling between 450 and 600° C., which is for intrusive igneous rocks about 0.2 to 0.8 of the induction (J_k) calculated from the observed susceptibility and the total intensity at this time. Many intrusive rocks, especially lavas, have a higher ratio --from 1 to 10. This high ratio must be explained by a remanent magnetization near saturation and a large coercive force; the available inductive susceptibility at 20° C. is now smaller than was the corresponding susceptibility at the higher temperature above 400°. The variability of this ratio suggests a variability of some physical conditions, for example, movements, during the time of cooling at the temperature at which magnetization becomes remanent. The average influence of the remanent magnetization of intrusive and of many extrusive rocks at some distance is often very small, while the direction of the magnetization is changing rapidly, as was proved by measurements on different rocks. The absolute value of susceptibility (K) and of the remanent magnetization (J) is often not constant in a cube of 4 to 7 centimeter edge.

This inhomogeneity u_1, u_2, u_3, and the anistropy a_1, a_2, a_3, were also measured for the three directions of a cube of the rock.--Author's abstract.

EARTH MOVEMENTS AND TERRESTRIAL MAGNETIC VARIATIONS

By Ross Gunn

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 151-156

It is shown that a general contraction of the earth or a movement of a small part of it may give rise to appreciable disturbing magnetic fields. The movement of a conducting region inside the earth across the earth's magnetic field sets up electromotive forces which may produce large current systems. These current systems can give rise to the observed magnetic variations if the conductivity of the earth's core is sufficiently large.

Earlier determinations of the resistivity of the earth's core are found to be to several orders of magnitude too high, due to the neglect of skin effects. It seems probable that the electrical time-constant of the earth's core is not less than 1,000 years, and therefore magnetic diurnal variation data can not be used to calculate its conductivity.--Author's abstract.

EARLY DECLINATION OBSERVATIONS, KAMCHATKA TO BERING STRAIT

By W. N. McFarland

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 161-164

This article contains a list of measurements of the magnetic declination at 23 points along the Siberian coast from Kamchatka to Bering Strait, as observed by the officers of Bering's expedition of 1728 and 1729, together with a declination chart of the region based on the observations.--Author's abstract.

LATEST ANNUAL VALUES OF THE MAGNETIC ELEMENTS AT OBSERVATORIES

By J. A. Fleming

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 165-177

Annual values of the magnetic elements observed at a very large number of observatories (91) scattered all over the world are compiled by the author.

In the remarks accompanying the list the author notices that the uneven distribution of magnetic observatories is strikingly evident and in particular the lack in the southern hemisphere, especially in Africa and the oceanic areas. Locations in which fully equipped observatories, which would contribute greatly to the needs of research in terrestrial magnetism, should be established are mentioned.--W. Ayvazoglou.

DAS NEUE OBSERVATORIUM IN NIEMEGK

(THE NEW OBSERVATORY IN NEIMEGK)

By A. N. Nippoldt

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 180-181

Tells briefly of the installation of a new observatory in Niemegk with its directors remaining in Potsdam. The old buildings in Potsdam are transformed into geomagnetic laboratories. The new observatory received the name "Adolf Schmidt Observatory for Earth Magnetism" in commemoration of Prof. Adolf Schmidt, whose seventieth birthday was celebrated on the day of the opening of the observatory.--W. Ayvazoglou.

SUR LES PROPRIÉTÉS MAGNÉTIQUES DES ROCHES

(ON THE MAGNETIC PROPERTIES OF ROCKS)

By G. Grenet

Annals Physique, Paris, vol. 13, March, 1930, pp. 263-348

An abstract of this article is published by H. Harradon in the Terrestrial Magnetism and Atmospheric Electricity, vol. 35, No. 3, 1930, p. 183. The abstract reads as follows:

> The first part of the paper is devoted to a historical sketch in which the author passes in review the work of the principal investigators who have occupied themselves with the study of the magnetization of rocks and summarizes their individual contributions to our knowledge of the subject. He then comments critically on the various methods employed for determining the magnetic susceptibility of rock samples and gives a detailed description of the two instruments selected for his own measurements, namely, a Curie-Cheneveau balance with certain modifications and a Hughes induction balance especially adapted to the rapid determination of the coefficient of magnetization of rock samples of moderate size. The use of this latter instrument is justified on the ground that the eddy currents induced in the samples do not vitiate the measurements to an appreciable extent.
>
> A detailed exposition and discussion of the results of the investigations are given, from which the author draws the following conclusions: (1) Although the classification of rocks used in petrography does not conform to a classification of the magnetic properties, rocks rich in ferromagnesian constituents are in general more magnetic than rocks poor in these elements; (2) an examination of thin sections by a polarizing microscope shows that the values of the susceptibility observed are explained by the magnetic content of the respective samples; (3) in the present state of our knowledge, it may be assumed that magnetite is the principal magnetic constituent of

rocks although the experiments of various investigators seem to prove that certain rocks contain other magnetic substances which are revealed by their Curie points; (4) the experiments of A. Michel-Levy and the author show the relations observed between the increase of susceptibility of certain rocks after heating and the changes brought about in their constituent minerals; (5) rocks of fluidal texture have a slight magnetic anisotropy.

The investigations described were made at the Institut de Physique du Globe of the University of Paris.

A bibliography containing 64 titles concludes the paper.--
H. D. Harradon.

BESTIMMUNG MAGNETISCHER SUSZEPTIBILITÄTEN VON GESTEINEN UND MINERALIEN IN SCHWACHEN MAGNETISCHEN FELDERN

(DETERMINATION OF MAGNETIC SUSCEPTIBILITIES OF ROCKS AND MINERALS IN WEAK MAGNETIC FIELDS)

By J. Koenigsberger

Centralblatt fuer Mineralogie, Geologie und Paläontologie,
1929, Abt. B, No. 4, pp. 97-107

In this article the author discusses the application of a method by which the determination of the susceptibility of rocks and minerals in weak magnetic fields is possible and which is especially useful if many samples, not all of which can be brought to the laboratory, are to be investigated. The method is explained on the basis of examples and illustrated by figures.--
W. Ayvazoglou.

UEBER DAS MAGNETISCHE VERHALTEN VERSCHIEDENER HARZGESTEINE

(ON THE MAGNETIC BEHAVIOR OF VARIOUS HARZ-ROCKS)

By H. Reich and W. Wolff

Centralblatt fuer Mineralogie, Geologie und Palaontologie,
1929, Abt. B, No. 5, pp. 153-161

In this article the authors give the results of their investigations made on the magnetic effect of various Harz-rocks. These investigations may serve as a basis for future work. The most important result of the investigation consisted of the fact that a relatively strong magnetic effect of the red hematite deposit in the central Harz was proved. The magnetic profile given in the article shows a surprising conformity with the known geological conditions of the region.

The results of investigations made by the authors upon various Harz-rocks are summed up as follows:

1. The Paleozoic sediments of the Harz are magnetically very weak. The susceptibility of Wissenbacher slate is slightly higher and that of Culm sediments is lower than the susceptibility of the other layers.

2. The behavior of the deep rocks of the Brocken and Ramberg is varied. The granites of the Ramberg massif are magnetically very weak and do not differ greatly from the sediments surrounding them. On the other hand, the diorites and perhaps one part of the border granites of the eastern zone of the Brocken massif are magnetically very strong.

3. Eruptive rocks and dike rocks. The effects of diabases and keratophyres are, of course, not as strong as those of the deep-rocks mentioned above, but sometimes the effects are very marked, especially in case of coarse-grained diabases. The meso-volcanic dike rocks are magnetically very weak.

4. The red hematite deposits have shown very high magnetic disturbance values owing to the presence of the magnetic modification of Fe_2O_3 as well as of magnetite.--W. Ayvazoglou.

COST OF MAGNETOMETER SURVEYING

By Dart Wantland

The Colorado School of Mines Magazine, vol. 20, No. 10, 1930, p. 24

Figures on the cost of magnetometer surveying, based on data furnished by an oil company, are given.

Four cases of surveying carried out in California, Western Canada, southwestern Texas, and Texas (Panhandle) are examined.

The following factors are to be considered: Weather, personnel, topography, transportation, location in respect to section corners, lost time, depreciation of car and instrument, and salary.

According to the author the personnel factor is by far the most important one in a discussion of real cost; that is, cost measured in quality of the work done.--W. Ayvazoglou.

PRELIMINARY RESULTS OF GEOLOGIC-PROSPECTING WORK CARRIED OUT BY THE GEOLOGICAL COMMITTEE IN 1929 IN THE REGIONS OF IRON-ORE DEPOSITS (IN RUSSIAN)

By A. J. Serk

Osvedomitelniy bulleten po Poleznim Iskopaemim,
vol. 3, No. 1, 1930, pp. 6-13

The author describes in this article the geophysical work carried out in addition to the geologic survey and drilling in the following regions of the U.S.S.R.:

In the Krivoy Rog a systematic magnetic method of prospecting was used in the region of Melitopol and Krementchug. An anomalous strip about 70 kilometers in length was established to the S.SW. of the city of Orekhov, as well as several other magnetic anomalies in the region of Krementchug and Nikopol.

New places of magnetic anomalies were discovered in the Troitsko-Osamsk deposits, as well as in the regions of Minusinsk and Nerchinsk in Siberia.--W. Ayvazoglou.

3. SEISMIC METHODS

UN NOUVEAU TYPE DE SISMOGRAPHE PHOTOGRAPHIQUE

(A NEW TYPE OF PHOTOGRAPHIC SEISMOGRAPH)

By P. Guido Alfani

Ciel et Terre, vol. 46, No. 6, 1930, pp. 147-154

The author of this article introduced at the end of 1925 at the Ximenien Observatory a photographic seismograph of Galitzine type but with some constructive changes. The new apparatus was tested during a long period of time and the details of its construction are published now after the results of tests have proved to be very satisfactory.

In this article Alfani gives the description of the seismograph (including the registering apparatus and the lamp) as well as its photographic picture and schematical design. In conclusion he says that, although only the well-known principles are utilized, the apparatus differs from those used generally in the following important particulars: (1) A new method of connection is used between the pendulum and the amplifying system by which the mechanical friction is omitted entirely, and (2) the coefficients of amplification and damping are much higher than those obtained in the other modern seismographs.

The value of the apparatus is increased still more owing to its simple construction, low price, facility in operation and perfection of seismograms. Two seismograms taken at the same time, one by a Galitzin seismograph and the other by the new photographic seismograph, are added to the article for comparison.--W. Ayvazoglou.

NÄHERUNGSFORMELN ZUR BERECHNUNG DER AMPLITUDEN DER ELASTISCHEN WELLEN DIE BEIM DURCHGANG EINER GEGEBENEN WELLE DURCH EINE UNSTÄTIGKEITSFLÄCHE ENTSTEHEN

(APPROXIMATE FORMULAS FOR THE CALCULATION OF THE AMPLITUDES OF ELASTIC WAVES GENERATED AT THE PASSAGE OF A GIVEN WAVE THROUGH A LAYER OF DISCONTINUITY)

By H. P. Berlage, Jr.

Gerlands Beiträge zue Geophysik, vol. 26, No. 2, 1930, pp. 131-140

K. Zoeppritz in his article (Ueber Reflexion und Durchgang Seismischer Wellen durch Unstetigkeitsflächen, Nachrichten Göttingen, 1919, p. 66) has worked out the extremely complicated relations between the amplitudes of the longitudinal and transversal reflected and refracted waves, generated at the passage of longitudinal and transversal seismic waves through a layer of discontinuity, in the abridged form of matrices.

The formulas given in this article are easier to operate with, but claim to be exact only in case of:

1. The reflection by a free surface (density of the second medium = 0);
2. Identity of the two media;
3. Reflection by a solid boundary (density of the second medium $= \infty$);
4. Any given density of the media, if the angles of incidence of the primary wave are 0 or 90°.

In every other case the formulas yield approximate values for the amplitudes of the secondary waves, with an error of probably not more than 0.1 of the amplitude of the incident wave.

The ratio of the velocities of propagation of condensational and distortional waves has been supposed to amount to 3. Thus liquid media have been ruled out.

The formulas should be used only in cases when the denser medium possesses greater velocity of propagation. Moreover, they do not extend to cases of total reflection.

The solution of two practical problems closes the paper.--Author's abstract.

DIE ERSTE BEWEGUNG BEI EINEM ERDBEBEN

(THE FIRST MOVEMENT PRODUCED BY AN EARTHQUAKE)

By M. Hasegawa

Gerlands Beiträge zur Geophysik, vol. 27, No. 1, 1930, pp. 102-125

Based on the quadrant distribution of the pull and shock of the first movement produced by an earthquake, as calculated by T. Shida, it is possible to draw a supposition concerning the break inside of the material; this may be formulated as follows: The internal break is caused by a shearing pressure in a plane; the breaking movement depends only on this shearing pressure independent of other internal pressures existing there. The theoretical distribution of the first movement of P and S caused by this shearing at one point of the break is calculated. The probable direction of the propagation of the break in the hypocenter is at the same time determined by this mathematical calculation. The distribution of the first movement depends on the proceeding of the break. If the breaks have the same direction in all the points in the region of the hypocenter, then the first movement is distributed, in the first approximation, equally to that at the point of the break, although the amplitude ratio is more or less deranged.

It was proved by observation of the Tango earthquake that the pull and shock of the first movement produced by the break in a certain azimuth corresponds to the pull and shock of the first P-wave at the distant stations of the same azimuth. From this relation a theoretical conclusion is drawn, that the amplitude and the period of time of the first movement in the earthquake diagram are not the decisive factors for the first movement of the break but that they depend directly on the proceeding of the break.

The earthquake break (with the exception of comparatively deep earthquakes) has, as it seems, a tendency to be distributed in case of a horizontal shearing pressure along a vertical plane. The author examines also the distribution of the first movement in case of an inclined orientation of the break.

In conclusion, the author draws attention to some problems concerning the quakes caused by collapses and explosions.--Author's abstract translated by W. Ayyazoglou.

AN ANALYSIS OF THE S-WAVE

By Frank Neumann

Bulletin of the Seismological Society of America,
vol. 20, No. 1, 1930, pp. 15-33.

Of the three elementary wave types radiating from a seismic focus (1) compressional or P-waves, (2) transverse or S-waves, and (3) surface or L-waves) the author examines in this article the S-wave, the nature of which remains to be explained in such a manner that it can be recognized from the motion of the earth particle at a seismographic station.

Headings of the article:

1. Description of the S-wave group;
2. Displacement diagrams and discussion of errors;
3. Illustrations;
4. Preliminary results;
5. Supplemental note on the theory of the S-wave.

In the summary to the article the author says:

The following empirical law governing the azimuth of S-wave impulses is advanced: (1) The azimuth of the horizontal S-wave impulse at the focus (the horizontal component of the initial earthquake displacement) is equal to (2) the azimuth from station to epicenter, plus (3) the azimuth from epicenter to station, or back azimuth, minus (4) the azimuth of the S-wave displacement at any station; all azimuths being counted from north around by east through 360°. It states that a common direction of horizontal impulse or thrust at a seismic focus can be calculated from S-wave azimuths observed at two or more distant stations. These focal thrusts appear to be either parallel or normal to fault lines.

A theory is later developed which appears to substantiate the above-named law in so far as it concerns simple horizontal focal displacements. S-wave impulses, due to a simple vertical displacement at a focus, apparently follow the laws of longitudinal motion, but arguments are advanced to question the existence of this type of activity. The displacements are longitudinal only in the sense that they occur in the planes of the rays; they are not compressional waves.

Three distinct types of activity are found in the S-wave group.--W. Ayvazoglou.

SEISMIC METHOD OF PROSPECTING (IN RUSSIAN)

By A. Seleznev

Vestnik Komiteta po delam izobreteniy (Gazette of the Committee for Examination of Inventions), No. 5 (67), May, 1930, pp. 1-3

The author discusses briefly the seismic method of prospecting and the use of seismographs and geophones.--W. Ayvazoglou.

4. ELECTRICAL METHODS

GEOELECTRICAL EXPLORATION METHODS USED IN OIL FIELDS

By Helmer Hedstrom

The Oil Weekly, vol. 58, Nos. 6 and 8, pp. 34-37 and 32-34.

The first part of this article presents, in a simple and nontechnical way, the principles underlying the use of geoelectrical methods for mapping of geologic structures. Different ways of applying electrical measurements for the surveying of structures are then described, and it has been attempted to make this presentation as elementary and easily understood to the average reader as possible. Detailed technical descriptions, which would be of interest mainly to those versed in the art of geoelectrical exploration, have been omitted, and reference to everyday physical phenomena are used to make clear the electrical phenomena in the subsurface. Thus the behavior of an electric current passing through the bordering surfaces between parallel layers with different conductivity is compared to the refraction and reflection of light at the contact planes between media like air, glass, and water (this comparison is, of course, fully justified, since the equipotential surfaces of an electric current in such "stratified conductor problems" behave exactly like the wave fronts of light entering a stratified system). Further, the electromagnetic induction of electric currents in subsurface beds is explained by reference to the action of the industrial transformer and to simple laboratory experiments.

Of the geoelectrical methods dealt with, the electromagnetic process is stated to be the most important and most widely used. This method, which is given a fairly complete description, consists in measuring the different phase components of the electromagnetic field produced by an alternating current in a wire laid out on the ground. The measuring apparatus, as employed in the field work, is shown in a photograph; it consists of a search coil and a compensator, referred to in the article as "an instrument used in physical laboratories." The electromagnetic field is measured in the semiabsolute units of microgauss per ampere primary current.

It is explained, and shown by a diagram, how the presence of conducting beds in the subsurface will modify the alternating electromagnetic field, and how it is possible, by the measuring of this field, to determine not only the depth of such "electrical key beds," but also their electrical characteristics.

The result of a survey by this method is a structure map showing contour lines drawn on some outstanding "electrical key bed," with a depth ranging from 200 to 1,500 feet. It is stated that this process is much faster and cheaper than core drilling, for which it offers a substitute.

The second part of the article presents some examples of practical results obtained by the electromagnetic method. Such investigations have been used for a variety of structural problems in Texas, Louisiana, and California, where up to now a total area of between 1,500 and 2,000 square miles has been covered by electromagnetic surveys. Four maps and one diagram with sections are given, which show good agreement between the results from the electrical survey and the geological data obtained from subsequent drilling.--Author's abstract.

ZUR MESSUNG DER ELEKTRISCHEN LEITFÄHIGKEIT DER ERDE DURCH INDUKTION

(ON THE MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY OF THE EARTH BY INDUCTION)

By J. Koenigsberger

Physikalische Zeitschrift, vol. 31, No. 10, 1930, pp. 478-485

The vertical component of the magnetic field strength produced by induced currents is calculated. These currents were induced in an infinite conducting semispace (Halbraum) by means of a circular current with a fixed radius passing through a very thin wire placed at the border of the semispace. Skin effect, small phase displacements, and screening off (Abschirmung) were neglected in the beginning. The errors produced by this were estimated. The semiempirical formula for the magnetic field of a current in a flat wire-circle is discussed and proved by observations. Only the first part of this formula is used during the integration; errors occurring by this are estimated.

The theory is applied to the earth, considering it a semispace; the observations proved that the resistance of the upper earth strata agreed in order with the resistance expected (3.10^4 ohms per cubic cm.).

For penetrating to depths of over 1 to 20 kilometers, frequencies less than 500 H are necessary. Sources of experimental errors and difficulties caused by this are explained briefly.--Author's abstract translated by W. Ayvazoglou.

THE INFLUENCE OF RAIN ON THE ATMOSPHERIC ELECTRIC FIELD

By A. Venkata Rao Telang

Terrestrial Magnetism and Atmospheric Electricity,
vol. 35, No. 3, 1930, pp. 125-131

Photographic records of the atmospheric-electric field variations at times of rains are examined along with pluviograms covering these periods. It is found that the normal effect of rain is to reverse abruptly the normal positive field in the early stages, while in a few cases it results in a sudden reduction without change of sign. This abrupt change disappears speedily when the disturbing shower is of short duration. An analysis of the results of G. C. Simpson at Simla (1908-1909) in regard to the charge brought down by rain is given. It is shown that in the earliest stages of charged rain, in more than 85 per cent of the cases the net charge brought down by rain is positive. It is then shown that the effect of rain on the field is due to the transfer of charge by the rain from the upper air.

Calculation shows that the charge transferred by the rain is of the order necessary to produce the observed changes of potential. The explanation covers the cases of heavy rain attended with frequent reversals and very high values of the field.--Author's abstract.

DIE HERTZSCHEN GLEICHUNGEN UND DEREN LÖSUNG FÜR DAS ÄUSSERE ERDMAGNETISCHE FELD

(HERTZ'S EQUATIONS AND THEIR SOLUTION FOR THE EXTERNAL EARTHMAGNETIC FIELD)

By A. Sloutschanowsky

Gerlands Beiträge zur Geophysik, vol. 26, No. 3, 1930, pp. 333-350

The subject of the proposed work consists of finding out the solutions of Maxwell Hertz's equations under the following conditions: A homogeneous medium rotates about the axis R with a small constant angular velocity W_o under supposition that the axis R in its turn rotates with a constant angular velocity W_o about an immobile axis R_o to which R is parallel. The region to be considered is the space between the two concentric spheres with their center at the point O which is taken on the axis R and remains on it during its motion together with the medium. The components of the magnetic field, which alone are subject to our consideration, are reported to the system of the coordinates with the center at the point O, firmly adjoined to the medium, which system in such manner wholly participates in the motion of the considered medium. The indicated solution can, to a certain degree, serve for the representation of the external magnetic field of the earth from its surface to the higher layers of the atmosphere.--Author's abstract.

SUR LES PROSPECTIONS ÉLÉCTRIQUES DU PÉTROLE

(ON ELECTRICAL PROSPECTING FOR OIL)

By A. Belluigi

La Revue Pétrolifière, No. 394, October, 1930, pp. 1451-1454.

Based on experience gained with electrical methods of prospecting, two opposite opinions on the direct discovery of oil are maintained at the present time; one supports the possibility of the direct discovery and the other denies this possibility.

In this article Belluigi discusses this question and defends his viewpoint, expressed in one of his previous works (Electrical Prospecting for Oil, L'Elettricita, No. 4, 1928) that all the different systems of electrical prospecting for oil may give good results if applied in places indicated and designated by geologists.--W. Ayvazoglou.

THE EARTH RESISTIVITY METHOD OF GEOPHYSICAL PROSPECTING; SOME THEORETICAL CONSIDERATIONS

By G. F. Tagg

The Mining Magazine, London, vol. 43, No. 3, 1930, pp. 150-158

Theoretical considerations illustrated by a series of curves and an actual example are given.

In conclusion the authors says that the extent to which results obtained theoretically can be of assistance in translating the observations obtained in the field must, of course, depend upon how closely the actual formations investigated approximate the conditions assumed in the theoretical investigations. In cases where the practical conditions approximate fairly closely those which have been considered, the results of the theoretical treatment given should serve as a useful guide to the way in which the practical observations are to be interpreted.--W. Ayvazoglou.

ELECTRICAL LOGS AND CORRELATIONS IN DRILL HOLES

By Conrad and Marcel Schlumberger

Mining and Metallurgy, vol. 10, No. 275, 1929, pp. 515-518

By making an "electrical log," the authors mean an operation to determine electrically the characters of formations traversed in drilling, the determination being carried out by means of measuring the electrical resistivities of the rocks along the uncased portions of drill holes. As in the case of an ordinary core record, this process indicates a geological study of the strata, and for that reason it is given a similar designation.

The paper is divided into three parts:

1. Electrical resistivities of rock formations: In this section the authors discuss in considerable detail the factors affecting the resistivities of various kinds of rocks.

2. Technique employed in making these electrical logs: In order to measure the resistivity of a formation at a certain depth in a drill hole, appropriate apparatus is lowered on the end of an insulated electric cable to the given horizon. The measuring arrangement is especially designed to eliminate entirely the perturbations due to the conductivity of the water in the drill hole and to the phenomena of polarization provoked by the current flow. The data obtained permit drawing up a diagram which constitutes the Schlumberger electrical log. The illustrations show several such logs.

3. Applications of the electrical log: The recovery of a core and its complete lithologic and paleontologic examination will, of course, almost always give more information than will the determination of the electrical resistivity of the rock to which it belongs. Thus, the electrical "core" should be considered as an auxiliary to the core of stone and is called on to replace the latter simply because it is much cheaper, more rapid, and frequently more easily employed.--W. Ayvazoglou.

A NICKEL-COPPER DEPOSIT IN NEW BRUNSWICK, CANADA

By Bela Low

Engineering and Mining Journal, vol. 130, No. 3, 1930, pp. 115-118.

The article begins with a brief description of the geology of the region. An electrical survey on the Rodgers, Hall-Carroll, and intervening ground was carried out before any drilling was done. The inductive method was applied. The results of trenching checked well with the electrical conductor outlined in the survey. On the Rodgers lens a strong indication of the presence of a conductor coincided well with the known sulphide lens. Owing to the fact that outcrops were scarce, the area being partly farm land and partly timber of second growth, it was deemed best to establish favorable locations for additional explorations by means of a magnetic survey.

Regions of magnetic anomalies were found, No exploration work has as yet been done along these magnetic anomalies, but the logical assumption is that they represent pyrrhotite bodies.

Maps are given showing (1) schist-gabbro contact and the location of two sulphide lenses and magnetic anomalies, (2) trenches and diamond-drill holes on Rodgers lens, and (3) dip-needle readings and position of electrical conductor in relation to surface outline of Rodgers lens are given.

Results of metallurgical research conclude the article.--W. Ayvazoglou.

GEOPHYSICS USED IN TRACING KEWEENAWAN FAULT

Editorial note

Engineering and Mining Journal, vol. 130, No. 5, 1930, p. 245

The geophysics department of the Michigan College of Mining and Technology has undertaken the important geological task of locating definitely the Keweenawan fault in localities where its real position has never been established.

The Keweenawan is the major fault of the district, bounding the copper bearing series on the south from the end of the Keweenaw peninsula to Lake Gogebic.

The character of the fault over its entire width can be determined, and the depth of the rock almost accurately calculated, by means of the varying electrical resistivity of the formations.--W. Ayvazoglou.

5. RADIOACTIVE METHODS

EIN VERBESSERTES VERFAHREN ZUR BESTIMMUNG DES GEHALTES DER FREILUFT AN RADIUMEMANATION

(AN IMPROVED PROCESS FOR THE DETERMINATION OF THE CONTENT OF RADIUM EMANATION IN FREE AIR)

By Walter Kosmath

Gerlands Beiträge zur Geophysik, vol. 27, No. 1, 1930, pp. 42-46

In this article the author shows that the cocoanut-charcoal process (the "suction method"), although improved in 1928, is not entirely suitable for the determination of the content of RaEm at a certain moment, or for the determination of the vertical distribution of the emanation.

The author mentions the demands to which a method for the determination of the content of RaEm at a certain moment may answer.

The method suitable to these demands is discussed and its advantage in comparison with the "suction method" is noticed.

The process examined in the article may be of importance also in connection with bioclimatic, balneologic, as well as medical questions.

The proceeding can be employed also during flights in airplanes and balloons.--Author's abstract translated by W. Ayvazoglou.

UNTERSUCHUNGEN ÜBER SCHWERE JONEN IN DER ATMOSPHÄRE

(INVESTIGATIONS ON HEAVY IONS IN THE ATMOSPHERE)

By Hans Israel

Gerlands Beiträge zur Geophysik, vol. 26, No. 3, 1930, pp. 283-313

With the apparatus described in the "first report" (Gerlands Beiträge, vol. 23, 1929, p. 144) measurements were made twice a day during one year and the number of small and large, positive and negative ions, as well as the nuclei of condensation, were counted, the latter with Aitken's Pocket Dust-Counter. A statistical study of the material obtained was made in connection with the other meteorological data. The variation of the number of large and small ions was always an opposite one. The nuclei of condensation had shown, of course qualitatively only, an attitude similar to that of the large ions. The influence of the large city upon the number of ions was very great. Their dependence on the air body could not be established beyond doubt owing to the disturbances caused by the city. Their relation to the relative humidity had shown that with the increase of humidity the conditions for the origination of large ions were more favorable. The proportion between the nuclei and large ions was not constant and changed with the meteorological conditions. The distinct annual and daily period of the number of ions seems to be in conformity with the amount of the inter-atmospherical change (Massenaustausch in der Atmosphere).--Author's abstract translated by W. Ayvazoglou.

GEOPHYSICAL PROSPECTING - RADIOACTIVE METHODS

By John H. Wilson

The Colorado School of Mines, vol. 19, No. 6, 1929, pp. 19-21

A brief description of the properties of the radioactive materials and tables of radioactive elements are given. The author discusses the following methods of radioactive prospecting:

1. Sample examination.
2. Atmospheric electricity method.
3. Investigation of soil gases.
4. Penetrating radiation method.

Five figures and a selected bibliography are added.--W. Ayvazoglou.

6. GEOTHERMAL METHODS

OBSERVATIONS GÉOTHERMIQUES DANS LE FORAGE STEBNIK 1

(GEOTHERMAL OBSERVATIONS IN THE STEBNIK 1 WELL)

By Stanislaw Zych

Institut de Géophysique et de Météorologie de l'Université de Lwow,
vol. 4, Communication No. 44, 1929, pp. 844-848

Data of temperatures measured on December 2, 1927, at different dept in the Stebnik 1 well (near Boryslaw) are given in a table.

The increase of temperatures with the depth is small and distributed regularly. For the differences of depth of 50 meters the increase varies between 0.75 and 0.85° C. The mean geothermal degree is 63.4 meters.

By comparing this value with those obtained in Boryslaw and Kalusz for the same differences in depth, shown in another table, it was established that the depth temperatures in the Stebnik well are considerably lower. This seems to be probably in relation with the salt layers and potassium salt layers crossed by the wells at a depth from 116 to 859 meters. In Kalusz the smallest increase was also observed in the salt layers--that is between 174 and 261 meters of depth.--W. Ayvazoglou.

DIE VORAUSBESTIMMUNG DER GEBIRGSTEMPERATUR IM INNERN VON GEBIRGSMASSIVEN

(PREDETERMINATION OF TEMPERATURE OF ROCKS INSIDE OF MOUNTAIN-MASSIFS)

By K. Pressel

Zeitschrift des Vereins doutscher Ingenieure,
vol. 73, No. 5, 1929, pp. 162-164

The author discusses the important question of determining the temperature of rocks inside of mountains. An attempt was made to solve this problem by mathematical calculations. Pressel describes methods in which the experimen are carried out on models. Possibilities of thermal and caloric model experiments are mentioned briefly. A third model experiment, an "electric" one, is described in more detail. Its usefulness was proved by observations made in tw well-known tunnels (Gotthard, Simplon). The results of the latter examination are given.

The following items are discussed: (1) Importance of temperature determination; (2) literature on temperature determination; (3) influences upon the temperature inside of mountains; (4) thermal model-experiment; (5) caloric mode experiment; (6) electrical model-experiment.--W. Ayvazoglou.

GEOPHYSICAL PROSPECTING - GEOTHERMAL METHODS

By John H. Wilson

The Colorado School of Mines Magazine, vol. 19, No. 8, 1929, pp. 13-17

Owing to the fact that geothermal methods may give valuable information under certain conditions it can be expected that future improvements in technique and in interpretation will provide a greater application in certain types of prospecting problems.

In this article the author explains the definitions and terms used in connection with geothermal research work and gives a table of thermal conductivities for a number of substances.

Under the heading "The heat of the earth" Wilson enumerates the conditions due to which the actual isogeothermal surfaces depart from the ideal shape of oblate spheroids as calculated theoretically. These conditions are given as follows: (1) Ocean floors, (2) mountain ranges and valleys, (3) nature of the rocks, (4) dip of the strata, (5) structural uplift and movement, (6) chemical action, (7) volcanic activity, (8) underground circulation of waters, and (9) climatic changes.

A number of different types of thermometers and cases used for depth-temperature measurements in wells are shown.

Interpretation of depth-temperature curves, illustrated by graphs, is discussed.

A figure of Salt Creek oil field, Wyoming, showing structural contours on Second Wall Creek sand and depths to the isogeothermal surface of 80° (according to Van Orstrand) is given, being one of the best examples of the relation between structural uplifts and geothermal anomalies.

In conclusion some other applications of the depth-temperature measurements are mentioned.--W. Ayvazoglou.

GEOTHERMAL VARIATIONS IN OIL FIELDS OF LOS ANGELES, CALIFORNIA

By Anders J. Carlson

The Bulletin of the American Association of Petroleum Geologists, vol. 14, No. 8, 1930, pp. 997-1011

Data obtained from temperature measurements in oil wells of the Los Angeles basin are presented, and some causes of abnormal temperature conditions and factors affecting the interpretation of geothermal data are noted. The relations of geothermal gradients and isothermal depths to structure are discussed for the Santa Fe Springs, Long Beach, and Torrance fields. Variations in the geothermal constants are considered with respect to the geology of the region, and the possible correlative value of temperature data is suggested.—Author's abstract.

7. UNCLASSIFIED METHODS

TRANSACTIONS OF THE AMERICAN GEOPHYSICAL UNION

Tenth Annual Meeting, April 25 and 26, 1929

Eleventh Annual Meeting, May 1 and 2, 1930

National Research Council, June, 1930, Washington, D. C., 314 pp.

In the introduction to this volume the general secretary of the unio Dr. J. A. Fleming, gives the following brief summary of the papers presented a the meetings:

> The tenth general assembly was held jointly, following a short business session of the Union, with the Section of Oceanography to hear general-interest papers which had been prepared for the program of the Section of Oceanography in addition to a number presented the preceding day at the Section meeting. The Section of Geodesy discussed progress-reports on gravity work in Mexico and in Europe and America and on geodetic work in Canada and in the United States, and papers on recent developments of geodetic methods, instruments and computations. In the Section of Seismology the papers were on surface-waves, the seismicity of the arctic, the forces and movements at the earthquake origin, and the practical application of earth-vibrations from dynamite blasts. The Section of Meteorology discussed the report of the meteorological division of the Committee on the Physics of the Earth of the Division of Physical Sciences of the National Research Council. The Section of Terrestrial Magnetism and Electricity held a symposium on physical theories of magnetic and electric phenomena. The Section of Volcanology heard communications on volcanic oceanic islands and the volcanic history of the San Juan Mountains of Colorado.
>
> At the eleventh general assembly, in addition to a series of six papers on "The utility of geophysics" in geodesy, seismology, meteorology, terrestrial magnetism and electricity, oceanography, and volcanology, the Union was addressed by Sir Hubert Wilkins on "The advisability of geophysical investigation in the arctic by submarine." Progress reports on work in Canada, Mexico, and the United States, on methods for the precise measurement of time and determination of gravity, and on correlative studies of latitude-variations featured the meeting of the Section of Geodesy. In view of common interests, the Section of Seismology, after a short business session May 1, met jointly with the Eastern Section of the Seismological Society of America on the morning and afternoon of May 5 at the Bureau of Standards and May 6 at the Georgetown University; six of the papers were presented by members of the Union and a symposium on the publication of earthquake data was led by Harry Fielding Reid of the Union. The Section of Meteorology discussed the relation between the Section of Meteorology of the International Geodetic and Geophysical Union and the International Meteorological Committee, as well as reports on

units of time, solar radiation, details of instruments, data required for indicating the climatological character of a region, and final report on the Bulletin on Meteorclogy in the series "Physics of the Earth" to be published by the National Research Council. The papers given before the Section of Terrestrial Magnetism and Electricity dealt with the proposed International Polar Year 1932-33, the significance and importance of continuance of magnetic and atmospheric-electric observations on the oceans with accounts of instruments suitable for work at sea, secular variations in the United States and over the earth's surface, and possible relationship of earth-movements and terrestrial-magnetic variation and of the aurora and the earth's magnetism. The Section of Oceanography had two sessions, one May 1 and a second May 2, hearing papers concerned with oceanographic work in its various phases and particularly with relation to physical oceanography and its relations to marine biology and meteorology. The program of the Section of Volcanology dealt with volcanic activity and the central African volcanoes.

The Union was favored at both the tenth and eleventh annual meetings by papers from members of the national committees of Canada and Mexico reporting on the progress of governmental activities and on results of geophysical researches stimulated by the committees. The active spirit of international cooperation on the part of Canada, Mexico, and the United States was again well evidenced in these papers and by the attendance of many visitors during the two annual assemblies.—J. A. Fleming.

GULF COAST RICH IN OIL

By T. E. Dabney

Manufacturers Record, vol. 98, No. 6, August, 1930, p. 56

In this article the author briefly summarizes the results obtained in Southern Louisiana and Texas by geophysical methods of prospecting (110 discoveries made by geophysical methods and 48 by nongeophysical methods).

The principles of the work of the torsion balance, seismograph, magnetometer, and the gravity pendulum are mentioned.

According to Dabney, since 1921, nearly $7,000,000 has been spent by oil companies on geophysical methods on the Gulf Coast alone, and at present about $300,000 a month is being spent in this region.

The Gulf Coast must be considered one of the largest potential petroleum reserves known to the industry.--W. Ayvazoglou.

NOTE ON A RECENT ARTICLE BY DR. HOPFNER

By Walter D. Lambert

Gerlands Beiträge zur Geophysik, vol. 26, No. 2, 1930, pp. 182-184

The article mentioned is entitled "Zur Bestimmung der Erdgestalt nach isostatischen Gesichtspunkten" (see Geophys. Abs. No. 13, p. 20).

Lambert's abstract of the present article reads as follows:

> The various determinations of the figure of the earth published by Hayford are not all strictly comparable, and indeed they are not intended to be so. This fact seems to have given rise to misunderstandings. To remove these some brief explanations are given. The effect of isostatic methods of reduction on the figure of the earth and value of various astronomical methods of determining it are briefly discussed.--Author's abstract.

UEBER DIE KONVERGENZ DER REIHE FÜR DAS ÄUSSERE RAUMPOTENTIAL

(ON THE CONVERGENCE OF THE SERIES FOR THE EXTERIOR POTENTIAL OF SPACE)

By F. Hopfner

Gerlands Beiträge zur Geophysik, vol. 27, No. 1, 1930, pp. 36-41

The question concerning the sphere of convergence in the development of the series for the exterior potential of a sphere is especially important for geophysics owing to the fact that the validity of a number of fundamental formulas, such as Clairaut's theorem, Bruns' theorem and others, depend on the answer to this question.

In this article the author shows that the development of the potential of space in series of spherical harmonics for the exterior space is convergent also in a certain region of the interior space of the attracting mass.--W. Ayvazoglou.

THE GEOLOGIST OF TODAY AND YESTERDAY

Editorial note

The Petroleum Times, vol. 24, No. 610, 1930, pp. 451-454

After the description of the work of a geologist for mapping out the structure of the underground from surface observations the geophysical means of prospecting, especially for oil, are discussed. Seismic, gravitational, and magnetic methods are briefly examined. Cooperation of the geologist, geophysicist, and the palaeontologist is at the present time required in order to reduce the chances of failure in drilling for oil.--W. Ayvazoglou.

THE WORK OF THE GEOPHYSICAL INSTITUTE OF THE CENTRAL GEOLOGICAL AND PROSPECTING SERVICE IN U.S.S.R. IN 1928-29 (IN RUSSIAN)

By J. Lepeshinsky and V. Chernobrovin

Osvedomitelniy bulletin po poleznim iskopaemin,
vol. 3, No. 2, pp. 15-19 and No. 3, pp. 18-23

The importance of geophysical methods of prospecting caused the creation in 1929 of a special Geophysical Institute for geologic-prospecting work with the following sections: Electrotechnical, magnetic, gravimetric, radiometric, seismic, and geothermal.

In this article the authors give the results of the work carried out during 1928-29 by the above-mentioned sections in the different regions of the U.S.S.R.--W. Ayvazoglou.

GEOPHYSICAL METHODS APPLIED TO EXPLORATION AND GEOLOGIC MAPPING

By T. M. Broderick and C. D. Hohl

U. S. Geological Survey, Professional Paper 144, 1929, pp. 156-168

The article forms a part of the work entitled "The Copper Deposits of Michigan," by B. S. Butler and W. S. Burbank. The authors discuss the possibility of application of geophysical methods to the exploration and geologic mapping of the region.

Theory and practice of magnetic surveying is mentioned especially.--W. Ayvazoglou.

INSTRUMENT FOR DETECTING METALLIC BODIES

By Theordore Theodorsen

Journal of the Franklin Institute, vol. 210, No. 3, 1930, pp. 311-326

This paper gives a description of a new instrument recently developed by the National Advisory Committee for Aeronautics at the Langley Memorial Aeronautical Laboratory (N.A.C.A. detector). The instrument was made for the immediate purpose of locating unexploded bombs which were known to have been dropped from airplanes at targets in close proximity of the site of the new Seaplane Towing Channel at Langley Field, Va. The new "detector" successfully located a number of bombs buried on and near the projected site. It is of a simple design and requires no skilled operators.

The author gives a brief theoretical survey of the general nature of the difficulties encountered in the design of sensitive detectors of this type. He points, in particular, to the importance of avoiding capacity and resistance effects, and outlines other essential factors contributing to the success of the new detector.

Thirteen figures illustrate the article.--Author's abstract.

FORTSCHRITTE DER ANGEWANDTEN GEOPHYSIK

(ATTAINMENTS OF APPLIED GEOPHYSICS)

By J. B. Ostermeier

Internationale Zeitschrift fuer Bohrtechnik, Erdölbergbau und Geologie,
vol. 38, No. 16, 1930, 14 pp.

In this article, which is a reprint of a lecture delivered by Ostermeier before the second general meeting of the International Oil-Union held on June 14, 1930, in Vienna, the author notices the attainments made by geophysical methods of prospecting.

Gravitational, seismic, electrical, and magnetic methods are discussed, based on examples.

Photographic pictures of instruments and a series of diagrams are shown in 21 figures illustrating the article.--W. Ayvazoglou.

SOCIETY OF PETROLEUM GEOPHYSICISTS

Editorial note

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 10, 1930, pp. 1364-1365

Information on the organization of the Society of Petroleum Geophysicists is given. The object of the society is to bring together geophysicists who are engaged in oil work and to advance the science of the application of physics in oil geology.

The requirements for membership are enumerated.

The following officers were elected: President, Donald C. Barton; vice-president, E. E. Rosaire; secretary-treasurer, John Weinzierl.

Application blanks may be obtained from the secretary at 608 Petroleum Building, Houston, Tex.--W. Ayvazoglou.

8. GEOLOGY

SURFACE GEOLOGY OF COASTAL SOUTHEAST TEXAS

By Donald C. Barton

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 10, 1930, pp. 1301-1321

The formations at the surface in coastal southeast Texas are the "Lissie," Beaumont, Recent, and Recent Terrace deposits. The Hockley scarp, one of the most striking physiographic features of the region, is a flexure scarp partly buried by alluvial deposits. The area in front of the Hockley scarp in southeast Texas is largely a deltaic plain composed of the coalescent deltas of late Pleistocene Trinity and Brazos Rivers. The sands of the area of the Lake Charles loams and sands, currently mapped as Lissie, are continuous with the sands of the distributary ridges and are contemporaneous with the surface Beaumont clay, and that part of the Lissie at the surface seaward of the Hockley scarp is younger than that lying landward of the scarp and is a sandy phase of the Beaumont. An uplift of 20 to 30 feet is indicated in Orange County and in Cameron and Calcasieu parishes. A veneer of Recent sediments covers the seaward edge of the Beaumont clay. Two, possibly three, post-Pleistocene terraces are present in the valleys of the major streams. The soils of the early Recent terrace show the introduction of material from the Permian "Red Beds."--Author's abstract.

DIE ENTSTEHUNG DER KONTINENTE

(THE ORIGIN OF THE CONTINENTS)

By Josef Geszti

Gerlands Beiträge zur Geophysik, vol. 27, No. 1, 1930, pp. 1-25

In the ancient form of the earth the liquid sima masses were everywhere,--in the same height of strata--enveloped by light, molten sial masses. This concentric distribution of material, however, has been disturbed later on. At present the continents consist of sial and the bottoms of the oceans mostly of sima materials (vertical separation of material). It has been shown that this distribution of masses was created by thermodynamic effect.

The elevation of the continents has been attributed to the condensation of the sima masses, specially on the point of becoming solid during the transition from liquid to crystallized state.

The origin of the thermodynamic effect is being attributed to the inhomogeneous sial masses containing various auxiliary mixtures.--Author's abstract.

USE OF AIRPLANE PHOTOGRAPHS IN GEOLOGIC MAPPING

By Walter A. English

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 8, 1930, pp. 1049-1058

The demand for airplane photographs during the World War caused a rapid development in equipment and methods. This demand and the improvements in airplane performance laid the foundation for the present commercial applications of airplane photography. Many oil companies use photographs in field mapping and find several peculiar features of the photographs of particular value in geologic mapping.

Mosaics of various types are used for compilation of data, but line maps and contour maps can be constructed from photographs if maps of a greater degree of accuracy are desired.--Author's abstract.

9. NEW BOOKS

Breyer, Johannes, Ueber die Elastizität von Gesteinen (On the Elasticity of Rocks). Published by the "Preussiche Geologische Landesanstalt," Berlin, 1929, 53 pp., 5 tables, 9 figures, 3 synoptical tables. Price, R.M. 3-75.

Castelfranchi, Gaetano, Engineer of the École Superieure des Ingenieurs de Milan. Physique Moderne, Exposé Synthétique et Méthodique de la Physique d'Aujourd'hui et des travaux theoriques et experimentaux des plus grand physiciens contemporains (Modern physics, synthetical and methodical exposé of present physics and theoretical and experimental works of the most celebrated contemporary physicists). Translated into French by M. A. Quemper de Lanascol, Laureat de l'Institut. 660 pp., illustrations. 8-vo. Paris. Librairie Scientifique Albert Blanchard, 1930. Price, 70 fr.

Kohlrausch, Friedrich. Lehrbuch der praktischen Physik (Handbook of Practical Physics). 16th enlarged edition. Revised by W. Bothe, E. Brodhun, E. Giebe, E. Gruneisen, F, Hoffmann, K. Scheel and O. Schonrock. XXX and 800 pages, 395 figures. Leipzig, 1930. Teubner. Price: Stitched, R.M. 23, bound, R.M. 26.

Vernadsky, W. J. Geochemie in ausgewählten Kapiteln (Selected Chapters on Geochemistry). Translated from Russian by Dr. E. Kordes, Leipzig, 1930. Akademische Verlagsgesellschaft m.b.H. 370 pages. Price: R.M. 23; bound R.M. 25. Chapter I: History of geochemistry; II, Chemical elements and the different ways in which they occur in the earth's crust; III, Geochemistry of manganese and considerations of energy; IV, Silicon and silicates in the earth's crust; V, Carbon and the vital substance in the earth's crust; VI, The radioactive elements in the earth's crust.

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